



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,075	06/20/2003	Yukio Morishige	16748	9161

23389 7590 01/26/2005

SCULLY SCOTT MURPHY & PRESSER, PC
400 GARDEN CITY PLAZA
GARDEN CITY, NY 11530

EXAMINER

BUEKER, RICHARD R

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/600,075

Applicant(s)

MORISHIGE

Examiner

Richard Bueker

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/20/03</u> . | 6) <input type="checkbox"/> Other: ____. |

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-6 and 8, drawn to an apparatus, classified in class 118, subclass 723MP.
- II. Claims 7 and 9, drawn to a process, classified in class 427, subclass 596.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the apparatus can be used for another process such as activating an etching gas by irradiation with a laser beam instead of activating a film forming gas.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Esatto on Jan. 19, 2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-6 and 8. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7 and 9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one

Art Unit: 1763

or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

In claim 8, line 9, the phrase "said the" should be changed to "the" to correct a grammatical error. Also, in claim 8, an "a" should be inserted at the beginning of each of lines 4, 6 and 8, to correct instances of non-idiomatic English.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6 and 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mikoshiba (5,753,320), who discloses a substrate processing apparatus that includes a laser (see Fig. 1 and col. 4, lines 35-39) for radiating a laser beam to a deposition area on a substrate and a plasma unit for turning a gas into a plasma state. Mikoshiba teaches the use of an arc discharge (col. 4, lines 47-49 and col. 22, lines 36-39) to form the plasma. Mikoshiba also teaches (col. 10, lines 31-33) that the generated plasma can flow into contact with

the substrate. The plasma formation gas of Mikoshiba can be considered to inherently be a "pretreating" gas. Also, the apparatus of Mikoshiba has an inherent capability of being used with the types of plasma formation gases that applicants describe as pretreating gas. The type of gas to be used in an apparatus is an intended use of the apparatus and is not as apparatus limitation per se. Also, regarding claim 8, it is noted that the claim limitation of "a substrate holder capable of moving a substrate having a pattern, said pattern having a defective portion" only defines a substrate holder and does not require any particular type of substrate to be present. Mikoshiba discloses (col. 9, lines 23-25) that his substrate holder is "capable of moving a substrate" as recited in claim 8, and Mikoshiba's substrate holder is inherently capable of holding a substrate having a defective pattern on it. Mikoshiba's apparatus inherently or at least obviously must include a control unit to control the operation of the laser and plasma unit to the extent required by claim 8.

Claims 1, 3 and 6 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hongo (5,182,231), who discloses (see Fig. 1) a laser CVD device that is a pattern defect correcting apparatus, comprising a plasma pretreating unit (see plasma cleaning electrode 9 or plasma sputter electrode 21 for example) in combination with a laser CVD unit (23, 24, 25, 26, 22) as claimed in claims 1, 3 and 6.

Claims 1, 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo (5,182,231) taken in view of Shvets (6,419,752). Hongo's apparatus is a micro-fabrication apparatus that is a pattern defect correcting apparatus. Hongo also

teaches the use of a focused ion beam (FIB) unit (see FIB 20 of Fig. 1) to remove material from a specific location on a substrate, prior to depositing a coating on that specific location by laser CVD using the laser beam 23. Hongo does not discuss the use of a plasma beam to remove material prior to the laser CVD step. Shvets however, discloses a plasma beam micro-fabrication apparatus, and he teaches that his plasma beam unit can desirably be used as a less expensive and less complex alternative to using a FIB unit for the material removal step in a micro-fabrication process. In view of this teaching of Shvets, it would have been obvious to one skilled in the art to modify the apparatus of Hongo by substituting a plasma pretreating unit of the type taught by Shevets for the FIB unit of Hongo.

Claims 2, 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hongo (5,182,231) taken in view of Shvets (6,419,752) for the reasons stated in the previous paragraph, taken in further view of Tsuchimoto (4,123,316), Ono (5,108,535) and/or Mikoshiba (5,803,974). Shvets does not specifically suggest the use of an arc to form his plasma. Shvets does, however, teach (col. 8, lines 10-20) that the particular mechanism for forming the plasma is not critical, and that a variety of conventional plasma forming means can be used. Tsuchimoto (paragraph bridging cols. 5 and 6), Ono (col. 10, lines 22-30) and Mikoshiba (col. 4, lines 47-49 and col. 22, lines 36-39) teach that an arc discharge was a conventional, well known way of generating a plasma for substrate processing. It would have been obvious to one skilled in the art to use an arc discharge to provide the plasma activation desired by

Shvets, because Tsuchimoto, Ono and Mikoshiba teach that arc discharges can successfully be used to activate a plasma for processing the surface of a substrate.

Claims 1-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frey (5,563,095) taken in view of Petvai (4,278,493), Cuomo (4,381,453) and/or Ohno (4,716,491). Frey (see col. 5, line 58 to col. 6, line 3; col. 9, lines 33-45; and col. 10, lines 35-40) discloses an apparatus which includes an ion milling unit which is used for pre-cleaning, and a laser CVD unit for forming a coating. Frey doesn't discuss the details of his ion milling unit. Petvai (Fig. 1 and col. 2, lines 1-3), Cuomo (Fig. 1, col. 1, lines 18-22 and col. 2, lines 1-10) and Ohno (col. 1, lines 18-27) describe the details of a conventional ion milling apparatus, which is used for pre-cleaning a semiconductor substrate prior to further processing. They teach that an ion milling unit conventionally includes a plasma chamber and a grid (i.e. a metal net as claimed in applicants' claim 5). Also, Ohno teaches that this type of plasma apparatus is an arc discharge plasma apparatus as claimed in claims 2, 4, 5 and 8. See also the patent to Anders (6,137,231) which is cited of interest for his teaching (col. 1, lines 40-48) that a Kaufman ion source is an arc discharge plasma device. It is noted that Cuomo (col. 2, lines 1-10) teaches that his ion milling source is a Kaufman source, and Anders makes clear that Cuomo's source is an arc discharge plasma apparatus. It would have been obvious to one skilled in the art to use an ion milling source of the type taught by Petvai, Cuomo and/or Ohno as the ion milling unit in Frey's apparatus, because Petvai, Cuomo and/or Ohno teach that their type of source can successfully be used for the cleaning step disclosed by

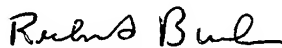
Art Unit: 1763

Frey. It is noted that applicants' claims as presently written do not require the plasma generated in the plasma chamber to contact the substrate while it is still plasma.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Richard Bueker
Primary Examiner
Art Unit 1763